Notes.

By the gracious command of the King, the Society of Tropical Medicine and Hygiene, which was founded in June, 1907, will henceforth be known as "The Royal Society of Tropical Medicine and Hygiene."

We recorded last week that at the anniversary meeting of the Linnean Society on May 27 the gold medal of the society was handed by the president to Sir Ray Lankester, to whom it had been awarded by the president and council. The president's anniversary address was devoted to an account of our present knowledge of the earliest known fossil fishes—the Ostracoderma—in the investigation of which Sir Ray Lankester was a pioneer, his monograph on Cephalaspis and Pteraspis having been published by the Palæontographical Society in 1870.

The first gold medal ever given by the Institution of Sanitary Engineers was presented at the annual summer meeting of the institution last week to Major A. J. Martin "for his services in originating Health Week and in the development of civil and military sanitation before and during the war."

Mr. Marconi, who has just returned from Italy by sea, has favoured us with the following appreciative reference to the late Prof. Righi :—"Although I never had, as is often stated, the privilege of being a pupil of Prof. Righi, I have always had, as is well known, a very deep admiration for him and for his great and far-reaching work in connection with physics, and particularly electric waves. Prof. Righi, whom I knew well personally, was a man of singularly unassuming character, and by his death not only has Italy lost one of her foremost scientific men, but the world also loses a brilliant and original worker in the field of electrotechnics."

Dr. F. G. Cottrell, Director of the U.S. Bureau of Mines, has been awarded the Willard Gibbs medal of the Chicago Section of the American Chemical Society.

The annual summer meeting of the Anatomical Society of Great Britain and Ireland is to be held at Cambridge on July 2 and 3. Papers on the morphology and development of the central nervous system have been promised, and there will be discussions on the structure of the earliest land vertebrates, the partial transposition of the mesogastric viscera, and avian structure as bearing upon problems of bird migration.

We are informed by the Secretary of the Department of Scientific and Industrial Research that the Research Association for the British Motor Cycle and Cycle Car Industry has been approved by the Department as complying with the conditions laid down in the Government scheme for the encouragement of industrial research. As the association is to be registered as a non-profit-sharing company, the promoters have applied to the Board of Trade for the issue of a licence under Section 20 of the Companies (Consolidation) Act of 1908. The secretary of the committee engaged in the establishment of this association is Major H. R. Watling, "The Towers," Warwick Road, Coventry.

At the eighty-sixth annual general meeting of the Royal Statistical Society, held on June 15, the following elections took place :—*President:* Sir R. Henry Rew. *Treasurer:* Mr. R. Holland-Martin. *Honorary Secretaries:* Mr. A. W. Flux, Mr. M. Greenwood, and Sir J. C. Stamp. *Honorary Foreign Secretary:* Mr. R. Dudfield. *Council:* Mr. W. M. Acworth, Dr. J. Bonar, Dr. A. L. Bowley, Miss Clara E. Collet, Major L. Darwin, Mr. G. Drage, Mr. R. Dudfield, Mr. A. W. Flux, Sir D. Drummond Fraser, Mr. J. H. Gorvin, Mr. M. Greenwood, Sir Robert Hadfield, Bart., Sir Edgar J. Harper, Mr. R. G. Hawtrey, Sir H. E. Haward, Mr. R. Holland-Martin, Dr. L. Isserlis, the Right Hon. F. Huth Jackson, Mr. A. W. W. King, Mr. H. W. Macrosty, Mr. E. R. P. Moon, Sir Shirley F. Murphy, Mr. H. V. Reade, Mr. C. P. Sanger, Dr. E. C. Snow, Mr. J. C. Spensley, Sir J. C. Stamp, Sir A. D. Steel-Maitland, Bart., Mr. T. H. C. Stevenson, and Mr. H. Withers. It was announced that the Guy medal in gold had been awarded to Dr. T. H. C. Stevenson.

Mr. Julian Baker has been re-elected chairman of the London Section of the Society of Chemical Industry, and Dr. Monier Williams is to take the place of Dr. S. Miall as honorary secretary, Dr. Miall having resigned the position. The new members of the committee are Mr. A. Chaston Chapman, Mr. J. Conner, Mr. A. H. Dewar, Dr. B. Dyer, and Prof. W. R. E. Hodgkinson.

The U.S. National Research Council, a co-operative organisation of leading scientific and technical men of the country for the promotion of scientific research and the application and dissemination of scientific knowledge for the benefit of the national welfare, has elected the following officers for the year beginning July 1 :—*Chairman:* H. A. Bumstead, professor of physics and director of the Sloane Physical Laboratory, Yale University. *First Vice-Chairman:* C. D. Walcott, president of the National Academy of Sciences and secretary of the Smithsonian Institution. *Second Vice-Chairman:* Gano Dunn, president of the J. G. White Engineering Corporation, New York. *Third Vice-Chairman:* R. A. Millikan, professor of physics, University of Chicago. *Permanent Secretary:* Vernon Kellogg, professor of biology, Stanford University. *Treasurer:* F. L. Ransome, treasurer of the National Academy of Sciences. The Council was organised in 1916 under the auspices of the National Academy of Sciences to mobilise the scientific resources of America for work on war problems, and re-organised in 1918 by an executive order of the President on a permanent peace-time basis. Although co-operating with various Government scientific bureaux, it is not controlled or supported by the Government. It has recently received an endowment of five million dollars from the Carnegie Corporation, part of which is to be expended for the erection of a suitable building in Washington for the joint use of the Council and the National Academy of Sciences. Other gifts have been made to it for the carrying out of specific scientific researches under its direction.

DR. R. S. MORRELL has been elected president of the Oil and Colour Chemists' Association in succession to Dr. F. Mollwo Perkin.

DR. V. H. MANNING, lately director of the U.S. Bureau of Mines, has been appointed director of research in the American Petroleum Institute.

DR. J. R. ANGELL, chairman of the U.S. National Research Council and professor of psychology in the University of Chicago, has been elected president of the Carnegie Corporation of New York.

MR. E. C. R. ARMSTRONG describes in the June issue of *Man* an interesting acquisition by the Royal Irish Academy of two penannular rings with cup-shaped ends, two bracelets, and an elaborately decorated disc—all of gold—found last year in a bog in Co. Cavan. The gold disc is of special value. The ornamentation, which was probably made by pressing the gold plate into a bronze matrix, is so fine that it is scarcely going too far to describe it as the most delicately decorated gold object belonging to the Bronze age that has up to the present been acquired by the Irish National Collection. The use of these discs has been a matter of doubt, but we have a parallel in a bronze specimen found at Trundholm Moss, in the north of Zeeland, and another of Irish origin in the British Museum. The ornamentation is probably connected with sun worship, but the Cavan discovery is of additional importance in that now for the first time a gold disc has been found in Ireland associated with objects, such as the gold rings and bracelets, which can be dated in the later portion of the Bronze age.

IN the same journal Mr. J. Reid Moir describes the discovery of an early Neolithic "floor" in the neighbourhood of Ipswich. On the surface of the gravel underlying a stratum of peat a flint implement of grey material, not rolled or patinated, representing a well-recognised type of an early Neolithic axe of the chipped and polished variety, was unearthed. In association with this, flakes, apparently of the Mousterian order, almost certainly more ancient than the Neolithic axe, were discovered. The mammalian bones associated with the "find" were examined by Prof. Arthur Keith, who identifies two varieties of the horse, large and small, of oxen, red deer, a wolf or large dog, pigs, and sheep. The horse-bones had been smashed up, apparently for the extraction of marrow.

IN *Sudan Notes and Records* (vol. iii., No. 2, April, 1920) the Rev. D. S. Oyler describes the Shilluks' belief in medicine men. They undergo a rite of initiation. A fact of interest connected with them is that "many of the medicine men have physical defects, their children are usually rickety, and many of them are deformed. The natives say that this is caused by the fact that the shades of his victims bring a curse on the medicine man, and also on his family." Few Shilluks will admit that they believe in his powers, but they seek him constantly, and their whole manner of life is influenced by the witch doctor. "So long as the Shilluks are dominated by the medicine men they will make very slight advancement in their mode of thought and their manner of living."

THE twenty-sixth Report of the Danish Biological Station to the Board of Agriculture (Copenhagen, 1919) contains two valuable memoirs. The first, by Mr. P. Boysen Jensen ("Valuation of the Limfjord, I.: Studies on the Fish-food in the Limfjord, 1909–1917"), summarises the work of several years based on valuations of the bottom invertebrate fauna with its special significance as fish-food. The study of the amount of food present in each year, its variation, rate of growth, and connection with the plaice fishery, shows interesting results. The fauna varies from year to year in both amount and kind, and the breeding seasons of the most important species differ, some breeding yearly, others apparently only once in several years. A careful comparison of the annual production and consumption shows that in certain areas the food is not sufficient to support an unlimited transplantation of plaice, and that the years which were specially bad for fishing were those in which there was an unusually small amount of food available. Prof. C. G. J. Petersen, in the second memoir ("Our Gobies (Gobiidæ) from the Egg to the Adult Stages"), adds much to our knowledge of the young stages of these little fishes, so numerous in our seas and so difficult to identify in their early life. We note with satisfaction that he finally allows the specific value of *Gobius minutus* and *G. microps*, hitherto usually regarded as distinct forms of one species, and shows that they can be distinguished throughout their life by skeletal features and by pigment. The very beautiful plates, both coloured and plain, illustrating the various stages in the life-history of the Danish gobies add much to the value of this work.

IN part iii. of their remarkable series of memoirs on Old Red Sandstone plants from the Rhynie chert-bed of Aberdeenshire (not younger than Middle Devonian) Dr. Kidston and Prof. Lang give a full and abundantly illustrated account of a third generic type, *Asteroxylon Mackiei*, of vascular Cryptogams discovered by Dr. Mackie, who figured a single transverse section of the stem. Like Rhynia and Hornea, Asteroxylon was a terrestrial plant which grew in a peaty soil. The subterranean portion of the plant consisted of slender rhizomes, 1–6 mm. in diameter, without absorbent hairs, having a broad cortex differentiated into an outer and an inner zone, and a simple vascular strand of spiral tracheids surrounded by a cylinder of phloëm. Branches of the rhizome passed through a transitional region characterised by the presence of scale-leaves into aerial foliage shoots 1 cm. to 1 mm. in diameter, bearing numerous spirally disposed small leaves; and it is probable that certain slender leafless branches occasionally associated with them represent fertile shoots which bore pear-shaped terminal sporangia without an annulus, and dehiscing at the broad free end. No actual connection between the leafless axes and sporangia or between either and the shoots of Asteroxylon has been demonstrated, but there is little doubt that they were parts of one plant. The vascular cylinder of the leafy shoots had a stellate stele, and from the enlarged ends of the arms small concentric leaf-traces were given off, which passed to the base of each leaf but never entered the free lamina. In habit Asteroxylon agrees closely with the well-known older Devonian plant, *Psilophyton princeps,* and to a rather less extent with Psilotum. It throws light on the morphology of certain Devonian plants known only as impressions, and raises many questions of theoretical interest which are discussed by the authors.

NEW light on several problems of Arabian geography has resulted from the war. In the *Geographical Journal* for June (vol. lv., No. 6) Dr. D. G. Hogarth deals with certain discoveries in the Hejaz. It has now been found that the watershed between drainage west to the Red Sea and north-east to the Persian Gulf lies further east than was previously supposed. Its exact course has still to be traced, but it certainly lies some distance back from the coast and runs through the Kheibar *harra* east of the Hejaz railway. Further south in Asir it comes nearer the Red Sea. Much material has been collected for the mapping of the Hejaz, especially in the north, against the Gulf of Akaba, and further south between Wejh and Rabugh. The intervening block, except for the littoral, is most imperfectly known. Considerable additions have also been made to our knowledge of the coast-line between Akaba and Aden. Dr. Hogarth concludes his paper by summarising some new information about Medina, of which a Turkish plan and several photographs have now been obtained. A British aeroplane which flew over the city secured a photograph of the railway station and immediate surroundings, but strict injunctions were given not to photograph the Haram or Great Mosque which contains the Tomb of the Prophet. The photograph secured on this occasion is reproduced, among others, with the paper.

THERE seems now to be evidence that so far back as the beginning of the Cambrian period conditions in the sea round the South Pole were not very favourable to life. In a piece of Lower Cambrian limestone dredged by the Scottish Antarctic Expedition from the bed of the Weddell Sea, and in other fragments of the same rock from the moraine of the Beardmore glacier on the opposite side of the South Pole, numerous remains of the sponge-like Archæocyathinæ have been found closely similar to those discovered in a corresponding formation in South Australia. All the Antarctic forms, however, are comparatively dwarfed, and show various thickenings and irregular additions to the skeleton which denote a struggle with adverse conditions. The specimens are described in great detail, with excellent illustrations, by Dr. W. T. Gordon in the Transactions of the Royal Society of Edinburgh (vol. lii., part iv.), but they do not throw any new light on the affinities of these remarkable fossils. They are associated with ordinary spicules of sponges, fragments of shells and trilobites, and a considerable growth of calcareous algæ.

THE *Museums Journal* for June welcomes the chance of increased co-operation between the University and the British Museum that would be afforded by the new site offered to London University, but points out that concentration is not altogether to the advantage of students arriving from the various residential districts, and that concentration in a restricted area will check the inevitable expansion of both University and Museum. This enforces, from another aspect, the argument put forward by Sir E. Sharpey Schafer in NATURE for June 17.

THE advances made in wireless telegraphy and telephony during the war were enormous, and in all the three fighting Services it has established itself as indispensable. A large section of the Signals experimental establishment at Woolwich is now devoted to the development of equipment to meet the requirements of the Army, which differ in several respects from those of the Navy or Air Force. Much of the apparatus has to be specially compact and mobile, and for the circumstances of modern warfare the quantity of messages to be dealt with in a short time renders high speed of transmission essential. The adaptation of the Wheatstone automatic transmitter, working from a previously punched paper strip, to wireless working enables speeds of transmission from 450 to even 1000 words per minute to be attained. The small currents through the contacts which are sufficient for wireless apparatus render the conditions particularly favourable for high speeds. Particular attention is given to the linking-up of line with wireless systems. High-speed messages come in over the wire in the ordinary way, and are automatically handed over to the wireless apparatus without loss of time in retransmission. Another recent development of wireless working, finding particularly useful application in the Army, is direction-finding, and very compact sets for this purpose with a range up to 250 miles are now being standardised at Woolwich. A point to which special experiment is being directed is the obtaining of a high degree of selectivity by which extraneous waves from near and far can be "tuned out" and the feeblest messages of the required frequency amplified to the extent necessary for satisfactory reception.

THE Deutsche Seewarte is resuming its activity in the direction of publications. We have received a report for the five years 1914–18, thirty-seventh to forty-first year of the institution, and with it an overdue report published in 1914 of a survey voyage of S.M.S. *Möwe* in 1911 to the West Coast of Africa. The course was from Wilhelmshaven to Ferrol, Cadiz, Teneriffe, Dakar, Freetown, Lome, Lagos, Lome, Accra, Lome, Duala, Banana, Boma, Swakopmund, and Lüderitzbucht, the last being reached on October 7, 1911. The expedition went up the Congo as far as Boma. Observations were taken of the depth of the sea and of the currents, temperature, density, and salinity at different depths down to 2000 metres. This oceanography, divided into the three sections, North-West, Equatorial, and South-West Africa, was directed by Drs. G. Schott and B. Schultz. A meteorological log was kept by Dr. P. Perlewitz, including some kite observations. The regular observations were taken at intervals of four hours, whether in harbour or on voyage, and the elements tabulated, in addition to the latitude and longitude, are direction and force of the wind, barometer, dry- and wet-bulb temperature, relative humidity, cloudiness, sea-surface temperature, strength of current, and rainfall, with notes of any unusual phenomena, including the appearance of albatrosses and schools of dolphins or flying-fish. The charts included with the publication show the salinity and temperature in depth sections, the one for Mogador giving salinity, temperature, and density separately. The salinity seems to decrease southwards, and also generally with increasing depth.

The March number of *Terrestrial Magnetism and Atmospheric Electricity* contains a summary, by Mr. J. P. Ault, of the results of the magnetic survey of the Atlantic made by the *Carnegie* during her voyage from Washington to Dakar, West Africa, and Buenos Aires during the autumn and winter. While the values found for the magnetic dip differ often by two or three degrees from those given in the last Admiralty Charts 3598, 3603, and 3775, the values of the observed deviation of the compass to the west differ by more than a few tenths of a degree from the charted values in certain limited regions only. Thus in the region between the Gold Coast and the Island of Ascension the Admiralty Chart gives the deviation to the west about one degree too large, and between Trinidad and Buenos Aires there is a considerable area in which the deviation is given too small by the same amount.

Owing to the decrease in research at Harvard during the war, vol. xiii. of Contributions from the Jefferson Physical Laboratory covers the three years 1916–7–8, and at least a third of the volume is devoted to Dr. P. W. Bridgman's work on the effects of pressure on the electrical resistance and thermo-electric properties of more than twenty metals. The pressures used reach 12,000 kilograms per sq. cm., and the temperature ranges between 0° C. and 100° C. With the exception of wires of bismuth and antimony, the resistances of metallic wires subjected to hydrostatic pressure decrease with the pressure, following a linear law approximately, and at 10,000 kilograms per sq. cm. have values about 99 per cent. of their values at atmospheric pressure in the case of cobalt and tungsten down to about 90 per cent. in the case of lead, tin, and cadmium. The temperature-coefficient of resistance remains almost unchanged. The effect of pressure on the thermo-electric properties is much more variable. The normal effect is to increase the thermo-electric power of the metal, but in three out of the twenty metals tried this is not the case. In most cases both the Peltier and the Kelvin effects are increased, but there are many exceptions. The author considers that the electron theory is quite incapable of explaining these results.

We have received from Messrs. C. Baker, High Holborn, W.C., their classified list (No. 69) of second-hand scientific instruments. The list includes microscopes and accessories, telescopes and field-glasses, spectroscopes, surveying, astronomical, projection and physical apparatus, and contains particulars of more than 2000 pieces of apparatus. In these days of high prices intending purchasers would be well advised in the first place to consult Messrs. Baker's catalogue.

Our Astronomical Column.

Mercury an Evening Star.—The greatest elongation of Mercury (E. 25° 41′) occurs on June 29. On June 24 the planet will set at 9.54 G.M.T., or 1h. 34m. after the sun, and may possibly be detected close to the W.N.W. horizon by anyone with a good eye. A field-glass should render the planet distinctly visible about an hour after sunset.

The Zeeman Effect in Furnace Spectra.—In continuation of his well-known researches on furnace spectra, Mr. A. S. King has recently been investigating the Zeeman effect for iron and vanadium in the electric furnace. Observations of the effect of a magnetic field on spectra have up to the present been chiefly confined to spark spectra, so that it is interesting to compare the effects when different sources are used. The electric furnace possesses, in addition, certain advantages over spark spectra for this purpose, since most of the low temperature lines are much more readily examined. Also, the inverse effect for absorption spectra is easily obtained by introducing a graphite plug to give a background of continuous spectrum. A description of the apparatus and results is given in the *Astrophysical Journal* for March. The furnace tube was placed parallel to the lines of force in a field varying from 6500 gauss in the centre to 9000 gauss near the ends, and observations were made of one hundred iron lines and ninety vanadium lines. The results of these preliminary observations seem to show that the effect is independent of the source used, since the observed separations agree both in character and magnitude with those of corresponding spark lines.

The Lunar Parallax and Related Constants.—There is a set of quantities (the radius and figure of the earth, the intensity of gravity, the moon's parallax and the motion of her perigee and node) which are so intimately related that an alteration in one compels corresponding alterations throughout. Prof. W. de Sitter has endeavoured to obtain a mutually consistent series of values, and gives the results in vol. xvii. of the Proc. of the Royal Academy of Science, Amsterdam. It is impossible in a brief note to do more than give his conclusions.

Mean radius of earth—*i.e.* radius in geogr. lat. the sine of which is $\{\frac{1}{3}\}^{\frac{1}{2}} = 6{,}371{,}237$ metres.

Value of gravity at that latitude (unaffected by centrifugal force), 9·82014.

π^1 = sine moon's parallax/sine $1'' = 3422{\cdot}544''$.

Compression of earth, 1/296·0.

Constant of precession, 50·250″; luni-solar precession, 50·373″. Mass of moon, 1/81·50

$\frac{C-A}{C} = 0\,0032775$; where C, A are the principal moments of inertia of the earth.

Also, if A′, B′, C′ are the three principal moments of inertia for the moon, and

$$\alpha = \frac{C'-B'}{A'},\quad \beta = \frac{C'-A'}{B'},\quad \gamma = \frac{B'-A'}{C'},$$

β is found to be 0·000626, and $f = \frac{\alpha}{\beta} = 0{\cdot}92$.

This value of f is much larger than those previously found, which ranged from 0·49 to 0·75. In other words, the present paper makes the moon's equator less elongated towards the earth than previous determinations.

Prof. de Sitter's investigation reminds us of the late Prof. Harkness's "solar parallax and related constants." By a combination of all available evidence he deduced, nearly thirty years ago, a value of the solar parallax practically identical with that now accepted.